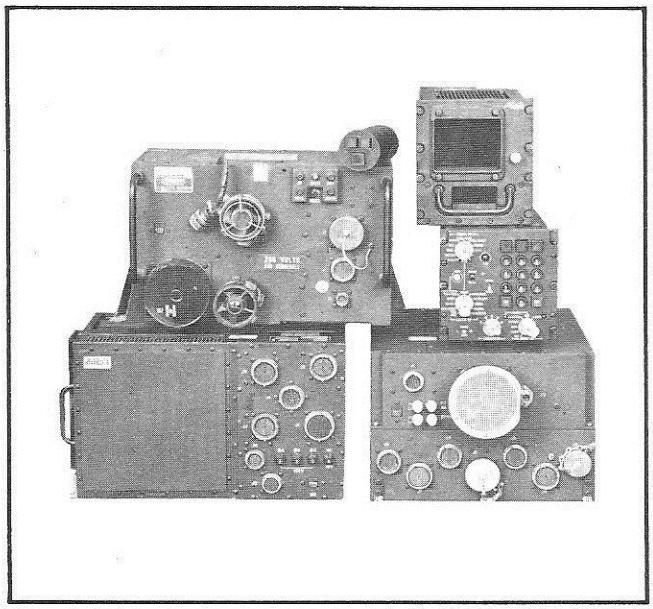
Elbit
MILITARY
PRODUCTS

F-4
WDNS



# F-4 UPDATE WEAPON DELIVERY & NAVIGATION SYSTEM (WDNS)

## INTRODUCTION

### PURPOSE

The existing F-4 analog navigation and weapon delivery sets (AN/ASN-63, AN/ASQ-91 and AN/ASN-46) raised, after many years of operation, the following problems:

- Marginal performance
- Low MTBF (Mean-Time-Between-Failures)
- High maintenance costs
- High MTTR (Mean-Time-To-Repair)

For the complete solution of these problems, Elbit developed, produced and manufactured the F-4 Update Weapon Delivery and Navigation System (WDNS) in a joint venture with a major U.S. avionics company.

The new WDNS offers the following advantages over the existing systems:

- Fully digital
- Improved weapon delivery accuracy
- Improved navigational accuracy
- Increased operational flexibility
- Improved reliability
- Improved maintainability
- No aircraft modifications required

### GENERAL CONFIGURATION

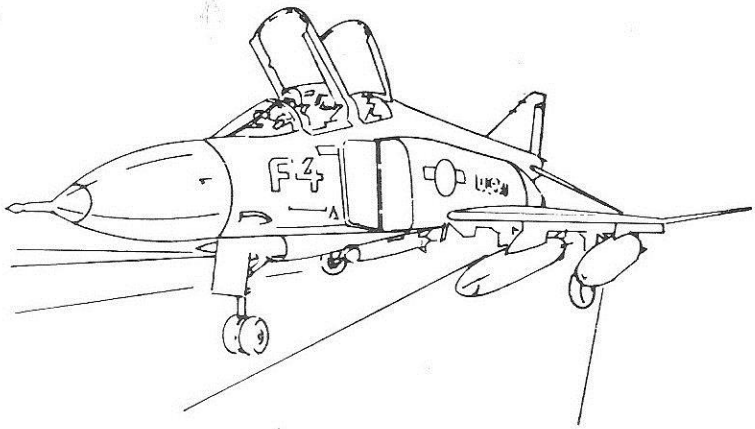
The F-4 Update WDNS is a state-of-the-art Weapon Delivery and Navigation System.

It has both blind and visual weapon delivery and navigational capability, using an Inertial Measurement Unit (IMU) as the prime sensor. The system also accepts inputs from the central air data computer of the aircraft, the fire control range radar, and various infra-red and optical target trackers.

The system provides flexibility in target designation, unrestricted delivery maneuvers, and minimum crew work load.

In addition, the system enables the pilot to:

- Navigate and arrive at the target on ETA with great accuracy
- Enter data and control commands before take-off
- Launch air-to-air missiles
- Handle new kinds of weapons



## SYSTEM FEATURES

- 0.8 nm/h (navigational accuracy)
- 7 mr C.E.P. (weapon delivery accuracy)
- Data and control commands easily entered
- Rapid warm-up
- 300 h MTBF
- Growth potential in:
  – computational capability
  – memory capacity
- Built-in self test
- Enhanced reliability and maintainability
- Interfaces with electro-optical weapon systems

## MODES OF OPERATION

- Air-to-Air (A/A)
- Air-to-Ground (A/G)
- Navigation (NAV)

### A/A MODE

- Missile envelope computations

### A/G MODE

- CCIP (Continuously Computed Impact Point)
- DIVE-TOSS
- TOSS
- STRAFE
- Special Ordnance – "smart" bombs

### NAV MODE

– Computation and display of steering commands for preselected designations
– Position, altitude and velocity updating

## SYSTEM UNITS

The system consists of the following 8 LRU's:

### 1. MISSION COMPUTER (MC)*

The MC is the central digital computer for the system. It directly interfaces, through digital channels, with the Inertial Measurement Unit, Navigation/Attack Data Panel (NAD) and the Aircraft Interface Unit (AIU).

Dimensions: 301x279x193 mm  Weight: 19.5 kg

### 2. AIRCRAFT INTERFACE UNIT (AIU)

The AIU provides the mutual interface between the MC and all other aircraft units/systems which interact with the system.

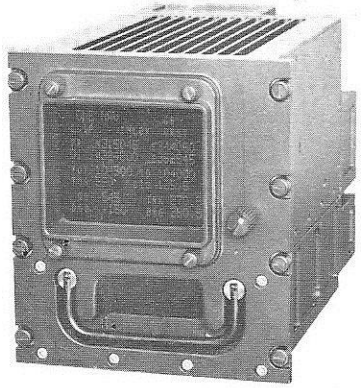
### 3. NAVIGATION/ATTACK DATA PANEL (NAD)

The NAD provides the following main functions:

- Insertion of various types of navigator-supplied information to the MC
- Control of different display data on the NDU (rear seat), and system status
- Supply of information to be displayed on MSDG (front seat)

### 4. NAVIGATION DISPLAY UNIT (NDU)

The NDU provides display of system information for rear-seat operator on a 2.4x3 in. CRT.



5. PILOT CONTROL PANEL (PCP)

The PCP provides the following functions:

- Enables the pilot to select radar or system display on the MSDG
- Enables the pilot to perform Position Update and to designate or to mark targets

6. FILTER REGULATOR (F/R)*

The F/R supplies regulated d.c. power to the IMU during interruption of normal operating power, for a maximum period of 5 seconds.

Dimensions: 254 x 76 x 76 mm Weight: 1.8 kg.

7. INERTIAL MEASUREMENT UNIT (IMU) *

- All-attitude reference platform
- 3-axis pendulus acceleration measurement

Dimensions: 334x216x207 mm Weight: 10 kg

8. RELAY ASSEMBLY (R/A)*

The R/A provides switching (through relays) of system signals to other aircraft systems.

Dimensions: 209x109x119 mm Weight: 2.72 kg

## TECHNICAL DATA

### Aircraft Interface Unit (AIU)

Discrete I/O. . . . . 40 output, 42 input
S/D Conversion . . . . . 4 channels
A/D Conversion. . . . . 16 channels
D/A Conversion. . . . . 17 channels
D/S Conversion . . . . . 11 channels
Synchro Buffer for IMU . . . . . 3 channels
Power Supply to NAD and NDU
Input Power . . . . . 115 VAC, 3Ø, 217 VA
28 VDC, 2A
Dimensions . . . . . 361 x 239 x 203 mm
Weight. . . . . .14.5 kg

### Navigation/Attack Data Panel (NAD)

Input Power . . . . . .+5 VDC, 3A
±15 VDC, 0.5 A
115 VAC, 400 Hz, 1Ø, 0.5 A
Environmental Conditions. . .As per MIL-E-5400 Class I
Dimensions . . . . . 223 x 146 x 142 mm
Weight. . . . . .2.9 kg

### Navigation Display Unit (NDU)

Viewing Area. . . . . .2.3 x 3 inches
Bandwidth. . . . . .30 Hz to 5 MHz, 3 db point
Contrast Ratio. . . . . .5:1
Input Power . . . . . 28 VDC, 15 W
115 VAC, 1Ø, 400 Hz, 40 W
Environmental Conditions. . .As per MIL-E-5400 Class I
Dimensions . . . . . 240 x 127 x 160 mm
Weight. . . . . .4.5 kg

### Pilot Control Panel (PCP)

Input Power . . . . . .14/28 VAC
Environmental Conditions. . .As per MIL-E-5400 Class I
Dimensions . . . . . .52 circular x 107 mm
Weight. . . . . .0.22 kg

* These units are not manufactured by Elbit.

## ELBIT QUALIFICATIONS

- 10 years experience in avionics design, development and production (hardware and software)
- Equipment on A-4, F-4 and Kfir aircraft
- Design based on operational experience

**The greatest care and skill, together with combat experience, assure quality and reliability.**

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